

## AMENDMENTS TO THE CLAIMS

This listing will replace all prior versions, and listings, of claims in the application:

5

### Listing of Claims:

80. (previously presented) A method for regulating a milking process, said method comprising the steps of

10

i) identifying at least one volume of milk,

ii) assessing particles in the identified volume by either

15

a) counting of substantially individual somatic cells in the volume of milk, or

b) assessing at least one property of at least one biological particle in the volume of milk,

20

iii) obtaining at least one result of the assessment of particles in the identified volume of milk,

iv) providing at least one predetermined milk quality parameter,

v) correlating the at least one result obtained in step iii) with the predetermined milk quality parameter provided in step iv),

5 vi) transferring any one or both of

c) the at least one result obtained in iii), and

d) the correlation obtained in v)

10

to regulating means capable of regulating the milking process of at least a portion of the milk being milked, and

vii) regulating the milking process based on any one or both of c) the at  
15 least one result obtained in iii), and d) the correlation obtained in v).

81. (currently amended) A method according to claim 80, said method further comprising assessing one or more chemical or physical property of the milk, ~~said assessment preferably being made substantially simultaneously with~~  
20 ~~the assessment of the particles in the identified volume of milk.~~

82. (currently amended) A method according to claim 80, wherein the assessment of particles is the counting of biological particles present in the milk, the biological particles having diameter of more than 0.1 mm, ~~preferably the~~

~~biological particles having diameter of more than 0.5 mm, more preferably the  
biological particles having diameter of more than 1 mm, more preferably the  
biological particles having diameter of more than 2 mm, more preferably the  
biological particles having diameter of more than 5 mm.~~

5

83. (currently amended) A method according to claim 80, wherein the biological particles are ~~one or several of~~ selected from the group consisting of: particles containing protein, particles containing somatic cells, ~~or~~ and particles containing body tissue.

10

84. (previously presented) A method according to claim 80, wherein the assessment of particles is the counting of blood particles.

15

85. (currently amended) A method according to claim 81, wherein the assessment of one or more chemical properties ~~is~~ comprises the estimation of the concentration and/or the level of one or more of: fat, protein, lactose, citric acid, urea, haemoglobin, ketones, carbon dioxide, oxygen, pH, potassium, calcium, or sodium.

20

86. (currently amended) A method according to claim 81, wherein the assessment of one or more physical properties ~~is~~ comprises the measurement of one or more of: temperature, conductivity, or light scatter.

87. (previously presented) A method according to claim 80, wherein the counting of the number of individual somatic cells and/or the assessment of one or more particles is done for one or more individual quarter(s).
- 5 88. (previously presented) A method according to claim 81, wherein the assessment of one or more chemical properties and/or the assessment of one or more physical property is done for one or more individual quarter(s).
- 10 89. (previously presented) A method according to claim 80, wherein the regulation of the handling of the milk is done individually for milk from one or more quarter(s).
- 15 90. (currently amended) A method according to claim 80, wherein the assessment of particles in the milk, ~~and/or the assessment of one or more chemical or physical property of the milk~~ is done substantially before ~~and/or or~~ after the identification of the individual animal being milked, ~~preferably where the identification is done by identification means reading one or more data carried by the individual animal.~~
- 20 91. (previously presented) A method according to claim 80, wherein the regulation of the handling of the milk is directing the milk to one or more storage means and/or outlets.

92. (currently amended) A method according to claim 80, wherein at least one of the result of the assessment of the volume of milk is/are transferred to a storage means, ~~preferably where the result is/are identified by identification of the animal,~~ the data of the storage means being available to computing means.

5

93. (previously presented) A method according to claim 80, wherein the assessment of particles is performed by automated microscopy performed by creating a spatial image representation of electromagnetic irradiation from an exposing domain containing a sample of the milk and performing a quantitated detection of the image.

10

94. (currently amended) A method according to claim 93, wherein the volume of the liquid sample from which electromagnetic radiation is irradiated is detected is in the range between 0.01  $\mu\text{l}$  and 20  $\mu\text{l}$ , ~~preferably in the range between 0.04  $\mu\text{l}$  and 4  $\mu\text{l}$ .~~

15

95. (new) A method according to claim 93, wherein the volume of the liquid sample from which electromagnetic radiation is irradiated is detected is in the range between 0.04  $\mu\text{l}$  and 4  $\mu\text{l}$ .

20

96. (currently amended) A method according to claim 93, wherein the signal which is detected for the assessment of particle is a signal which is ~~substantially~~ caused by attenuation of electromagnetic signal, ~~and/or by emission of electromagnetic irradiation by photoluminescence,~~ the attenuation ~~and/or the~~

~~photoluminescence~~ being associated to one or more molecules which is/are a part of the particle, ~~preferably where the particles are somatic cells and where the molecules are DNA and/or proteins.~~

5        97.            (currently amended) A method according to claim 96, wherein the  
signal which is detected for the assessment of particles ~~substantially~~ originates  
from one or several types of molecules ~~of types~~ comprising one of the following:  
10        a) molecules which bind to the particles; b) are retained within the particles; or c)  
interact with, the particles, such molecules being added to the sample before or  
during exposure of electromagnetic signals, the molecules being molecules  
giving rise to one or several of the following phenomena selected from the group  
consisting of: attenuation of electromagnetic radiation, photoluminescence when  
illuminated with electromagnetic radiation, scatter of electromagnetic radiation,  
15        or raman scatter.

15        98.            (previously presented) A method according to claim 97, wherein an  
effective amount of one or more nucleic acid dyes and/or one or more  
potentiometric membrane dyes is added.

20        99.            (currently amended) A method according to claim 98, wherein there  
is/are added one or more nucleic acid dyes selected from the group consisting of:  
~~phenanthridines (e.g. ethidium bromide CAS#: 1239-45-8, propidium iodide~~  
~~CAS#: 25535-16-4), acridine dyes (e.g. acridine orange CAS#: 65-61-2/CAS-~~  
~~10127-02-3), cyanine dyes (e.g. TOTO™ 1 iodide CAS#: 143-413-84-7-~~

~~Molecular Probes, YO PRO™ 1 iodide CAS#: 152 068 09 2 Molecular Probes),  
indoles and imidazoles (e.g. Hoechst 33258 CAS#: 023 491 45 4, Hoechst 33342  
CAS#: 023 491 52 3, DAPI CAS#: 28718 90 3, DIPI (4',6 (diimidazolin 2-yl) 2-  
phenylindole)), preferably wherein the nucleic acid dye added is propidium  
5 iodide CAS#: 25535 16 4.~~

100. (currently amended) A method according to claim 97, wherein any  
chemical added has the effect of aiding in the binding of one or more dyes to a  
particle, ~~preferably such chemical being t Octylphenoxypolyethoxyethanol  
(Triton X 100).~~

101. (currently amended) A method according to claim 97, wherein any  
chemical added has the effect of increasing the rate of dissolution or  
solubilisation of any chemical on ~~substantially solid, and/or substantially non-  
aqueous, and/or substantially freeze dried form, preferably such chemical being  
15 one or more types of organic or inorganic salts.~~

102. (currently amended) A method according to claim 81, wherein the  
assessment of any chemical property is based on spectrophotometric  
measurement, ~~the spectrophotometric measurement being, e.g., one or several of;  
20 mid-infrared attenuation, near infrared attenuation, visible attenuation, ultra-  
violet attenuation, photoluminescence, raman scatter, nuclear magnetic resonance  
and/or wherein the assessment of any chemical property is based on  
potentiometric measurement, preferably by the use of an ion selective electrode.~~

103. (currently amended) A method according to claim 80, wherein the volume of milk being assessed is a sample of milk which is undiluted, except for the addition of the reagents used in the assessment, ~~preferably the reagents being~~  
5 ~~on a substantially solid, and/or substantially non-aqueous, and/or substantially freeze dried form.~~

104. (currently amended) A method according to claim 80, wherein at least a part of the volume of milk being assessed is acquired and/or identified  
10 ~~substantially at the beginning of milking, preferably before 100 ml of milk have been milked, more preferably before 20 ml of milk have been milked, more preferably before 5 ml of milk have been milked.~~

105. (currently amended) A method according to claim 80, wherein at least  
15 ~~one of the assessment of particles, or chemical or physical property of milk is performed in a substantially disposable device, preferably where the device is discarded or disposed of after the assessment of a predetermined number of volumes of milk, and/or is disposed of in the event it becomes at least partially blocked, and/or is discarded or disposed of in the event it has become~~  
20 ~~substantially empty of any chemical or reagent used for the assessment.~~

106. (currently amended) A method according to claim 80, wherein at least one of the assessment of particles, or chemical or physical property of milk is performed in a domain where at least one physical dimension of the domain



~~substantially~~ partly determines the volume of the domain, and where the at least one physical dimension is ~~substantially~~ different during at least a part of any period when a sample is introduced to the domain and at least a part of any period when a measurement or detection is performed, ~~preferably where the effect is such that the volume of the domain is substantially larger during at least a part of any period when a sample is introduced to the domain than in at least a part of any period when a measurement or detection is performed.~~

107. (currently amended) A method according to claim 80, wherein ~~at least one of the assessment of particles, or chemical or physical property of milk~~ is activated or controlled by the controlling means controlling the milking.

108. (previously presented) A system for regulating a milking process, said system comprising:

- i) detecting means for identifying at least one volume of milk;<sub>i</sub>
- ii) means for assessing particles in the identified volume by either
  - a) counting of substantially individual somatic cells in the volume of milk;<sub>i</sub> or
  - b) assessing at least one property of at least one biological particle in the volume of milk;<sub>i</sub>

- iii) storage means for storing and providing at least one result of the assessment of particles in the identified volume of milk;<sub>i</sub>
- iv) storage means for storing and providing at least one  
5 predetermined milk quality parameter;<sub>i</sub>
- v) processing means for correlating the at least one result provided in iii) to the at least one predetermined milk quality parameter provided in iv);<sub>i</sub> and
- 10 vi) means for regulating the milking process based on the correlation obtained in step v).
109. (currently amended) A system according to claim 108, said system  
15 further comprising means for assessing at least one chemical or physical property of the milk, ~~said assessment being preferably made substantially simultaneously with the assessment of the particles in the identified volume of milk.~~
110. (currently amended) A system according to claim 109, wherein the  
20 assessment of one or more chemical properties ~~is~~ comprises the estimation of the concentration and/or the level of one or more of: fat, protein, lactose, citric acid, urea, haemoglobin, ketones, carbon dioxide, oxygen, pH, potassium, calcium, or sodium.

111. (currently amended) A system according to claim 109, wherein the assessment of one or more physical properties ~~is~~ comprises the measurement of one or more of: temperature, conductivity, or light scatter.
- 5 112. (currently amended) A system according to claim 108, wherein the assessment of individual somatic cells and/or the correlation of the counting to a value ~~substantially~~ representing the number of somatic cells per volume of milk is done for one or more individual quarter(s).
- 10 113. (previously presented) A system according to claim 108, wherein the regulation of the handling of the milk is done individually for milk from one or more quarter(s).
- 15 114. (currently amended) A system according to claim 108, further comprising detection means for identifying the animal and one or more information concerning the time of previous milking ~~and/or one or more information concerning the health of the animal.~~
- 20 115. (previously presented) A system according to claim 108, wherein the regulation of the handling of the milk is directing the milk to one or more storage means and/or outlets.
116. (previously presented) A system according to claim 108, wherein at least one of the result of the assessment of the volume of milk is/are transferred

to a storage means, wherein the result of identification of the animal is stored, the data of the storage means being available to computing means.

117. (currently amended) A system according to claim 108, wherein the  
5 milking apparatus is an automatic milking system.

118. (previously presented) A system according to claim 108, wherein the  
assessment of particles is performed by automated microscopy performed by  
creating a spatial image representation of electromagnetic irradiation from an  
10 exposing domain containing a sample of the milk and performing a quantitated  
detection of the image.

119. (currently amended) A system according to claim 118, wherein the  
volume identified is in the range between 0.01  $\mu\text{l}$  and 20  $\mu\text{l}$ , ~~preferably in the~~  
15 ~~range between 0.04  $\mu\text{l}$  and 4  $\mu\text{l}$ .~~

120. (new) A system according to claim 118, wherein the volume identified  
is in the range between 0.04  $\mu\text{l}$  and 4  $\mu\text{l}$ .

20 121. (currently amended) A system according to claim 109, wherein the  
assessment of any chemical property is based on spectrophotometric  
measurement, ~~the spectrophotometric measurement being, e.g., one or several of;~~  
~~mid-infrared attenuation, near infrared attenuation, visible attenuation, ultra-~~  
~~violet attenuation, photoluminescence, raman scatter, nuclear magnetic~~

~~resonance, and/or wherein the assessment of any chemical property is based on  
potentiometric measurement, preferably by the use of an ion selective electrode.~~

122. (currently amended) A system according to claim 108, wherein the  
5 volume of milk being assessed is a collected at different times during milking,  
~~preferably where the result of one or more assessment can be correlated to the  
property of the entire milk being milked.~~

123. (currently amended) A system according to claim 108, comprising a  
10 ~~substantially~~ disposable device comprising a sample compartment.

124. (currently amended) A system according to claim 108, wherein ~~at least~~  
~~one of the assessment of particles, or chemical or physical property of milk is~~  
performed in a domain where at least one physical dimension of the domain  
15 ~~substantially~~ partly determines the volume of the domain, and where the at least  
one physical dimension is substantially different during at least a part of any  
period when a sample is introduced to the domain and at least a part of any  
period when a measurement or detection is performed, ~~preferably where the  
effect is such that the volume of the domain is substantially larger during at least~~  
20 ~~a part of any period when a sample is introduced to the domain than in at least a  
part of any period when a measurement or detection is performed.~~

125. (currently amended) A system according to claim 108, wherein ~~at least one of~~ the assessment of particles, ~~or chemical or physical property of milk~~ is activated or controlled by the controlling means controlling the milking.

5 126. (new) A method according to claim 80, said method further comprising assessing one or more chemical or physical property of the milk simultaneously with the assessment of the particles in the identified volume of milk.

10 127. (new) A method according to claim 80, wherein the assessment of particles is the counting of biological particles present in the milk, the biological particles having diameter of more than 0.5 mm.

128. (new) A method according to claim 93, wherein the signal which is detected for the assessment of particle is a signal which is caused by emission of  
15 electromagnetic irradiation by photoluminescence, the photoluminescence being associated to one or more molecules which is/are a part of the particle.

129. (new) A method according to claim 96, wherein the signal which is detected for the assessment of particle is a signal which is caused by emission of  
20 electromagnetic irradiation by photoluminescence, the photoluminescence being associated to one or more molecules which is/are a part of the particle.

130. (new) A method according to claim 104, wherein at least a part of the volume of milk being assessed is acquired and/or identified before 100 ml of milk have been milked.
- 5 131. (new) A system according to claim 108, further comprising detection means for identifying the animal and one or more information concerning the health of the animal.
- 10 132. (new) A system according to claim 114, further comprising detection means for identifying the animal and one or more information concerning the health of the animal.
- 15 133. (new) A method according to claim 81, wherein the assessment of particles in the milk, and/or the assessment of one or more chemical or physical property of the milk, is done before or after the identification of the individual animal being milked.
- 20 134. (new) A method according to claim 81, wherein at least one of the assessment of particles, chemical or physical property of milk is performed in a disposable device.
135. (new) A method according to claim 81, wherein at least one of the assessment of particles, chemical or physical property of milk is performed in a domain where at least one physical dimension of the domain partly determines

the volume of the domain, and where the at least one physical dimension is different during at least a part of any period when a sample is introduced to the domain and at least a part of any period when a measurement or detection is performed.

5

136. (new) A method according to claim 81, wherein at least one of the assessment of particles, chemical or physical property of milk is activated or controlled by the controlling means controlling the milking.

10 137. (new) A system according to claim 109, wherein at least one of the assessment of particles, or chemical or physical property of milk is performed in a domain where at least one physical dimension of the domain partly determines the volume of the domain, and where the at least one physical dimension is different during at least a part of any period when a sample is introduced to the  
15 domain and at least a part of any period when a measurement or detection is performed.

138. (new) A system according to claim 109, wherein at least one of the assessment of particles, or chemical or physical property of milk is activated or  
20 controlled by the controlling means controlling the milking.